

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27554

CSAH NO. 12

OVER THE

CROW RIVER

DISTRICT 5 – HENNEPIN COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION

BY
COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 108)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 27554, Piers 1 and 2, were found to be in good condition with no significant structural defects observed. A heavy accumulation of timber debris was observed upstream of Pier 2, and a moderate accumulation of timber debris was observed around the entire pier shaft of Pier 1. The top of footing was exposed, with up to 8 inches of vertical exposure observed, 2.7 feet below the waterline around Pier 1. Heavy erosion of the grouted rip-rap protection on the East Abutment was observed.

INSPECTION FINDINGS:

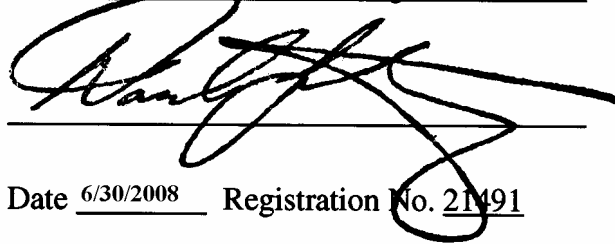
- (A) The top of footing was exposed at 2.7 feet below the waterline around Pier 1 with up to 8 inches of vertical exposure at the southeast corner.
- (B) The grouted cobbles (rip-rap) that were to protect the East Abutment exhibited heavy erosion with up to 75 percent loss of cobbles.
- (C) The concrete of both Piers 1 and 2 was found to be generally smooth and sound.
- (D) A moderate accumulation of timber debris consisting of logs up to 18 inches in diameter was located around the entire pier shaft of Pier 1. The timber debris extended from the channel bottom up to 1 foot above the waterline, 5 feet off of the faces, 20 feet off of the upstream nose, and 5 feet off of the downstream nose.
- (E) Along both side faces and around the upstream nose of Pier 2, a heavy accumulation of timber debris was observed. The debris extended from the channel bottom up to 3 feet above the waterline, 10 feet off of the pier faces, and 30 feet off of the upstream nose.

RECOMMENDATIONS:

- (A) Remove the timber drift that has accumulated around the piers including the large logs on the channel bottom at both piers, which could contribute to scour and footing exposure.
- (B) Monitor footing exposure at Pier 1 during future underwater inspections.
- (C) Repair and/or replace the grouted rip-rap erosion protection at the East Abutment.
- (D) Reinspect the submerged substructure at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

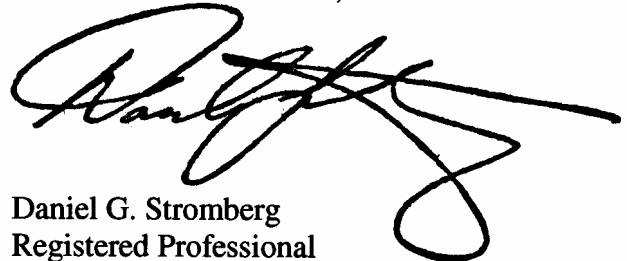
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 27554

Feature Crossed: Crow River

Feature Carried: CSAH 12

Location: District 5 - Hennepin County

Bridge Description: The superstructure consists of three spans of a concrete deck on multiple precast concrete girders. The superstructure is supported by two concrete piers and two concrete abutments, all of which are founded on timber piling. The piers are numbered 1 and 2 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Rouston

Date: August 14, 2007

Weather Conditions: Cloudy, 68 °F

Underwater Visibility: 0.5 feet

Waterway Velocity: None / Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Each pier consists of an oblong rectangular shaft with rounded noses that rests upon a rectangular footing founded on timber piling.

Maximum Water Depth at Substructure Inspected: Approximately 3.1 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the concrete parapet wall, above the north end of Pier 2.

Water Surface: The waterline was approximately 29.6 feet below reference.
Waterline Elevation = 841.4.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code U/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

X Yes No



Photograph 1. Overall View of the Structure, Looking South.



Photograph 2. View of Pier 1, Looking Northwest.



Photograph 3. View of Pier 2, Looking Southeast.



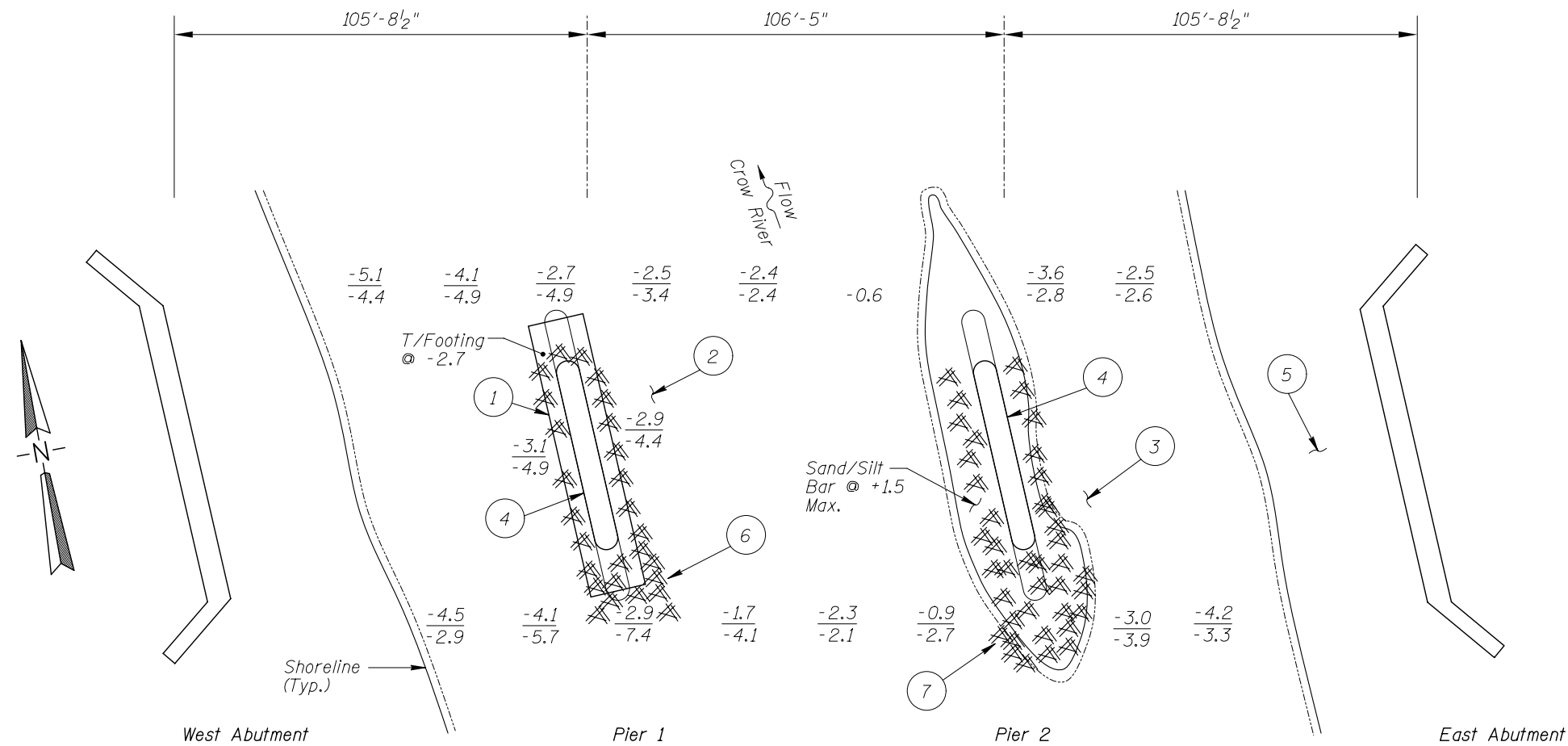
Photograph 4. View of Timber Debris at Pier 2, Looking South.



Photograph 5. View of heavy erosion of Grouted Rip-Rap at East Abutment, Looking East.



Photograph 6. View of West Abutment, Looking Southwest.



SOUNDING PLAN

INSPECTION NOTES:

- 1 The top of footing was exposed at 2.7 feet below the waterline around Pier 1 with up to 8 inches of vertical exposure at the southeast corner.
- 2 The channel bottom consisted of sand at Pier 1 with up to 6 inches of probe rod penetration.
- 3 The channel bottom consisted of silt at Pier 2 with up to 2 feet of probe rod penetration.
- 4 Concrete of both Piers 1 and 2 was smooth and sound.
- 5 The grouted rip-rap, up to 18 inches in diameter, that protected the East Abutment exhibited heavy erosion with up to 75 percent loss of cobbles.
- 6 A moderate accumulation of timber debris consisting of logs up to 18 inches in diameter was located around the entire pier shaft of Pier 1. The debris extended from the channel bottom to 1 foot above the waterline, 5 feet off of the faces, 20 feet off of the upstream nose, and 5 feet off of the downstream nose.
- 7 A heavy accumulation of timber debris consisting of 24-inch-diameter and smaller logs and branches was observed at the upstream nose and along both faces of Pier 2. The debris extended from the channel bottom to 3 feet above the waterline, 10 feet off of the pier faces and up to 30 feet off of the upstream nose.

TYPICAL END VIEW OF PIERS

GENERAL NOTES:

- 1 Piers 1 and 2 were inspected underwater.
- 2 At the time of inspection on August 14, 2007, the waterline was located approximately 29.6 feet below the top of the concrete parapet wall above the upstream nose of Pier 2. This corresponds to a waterline elevation of 841.4 based on the previous report dated September 24, 2002.
- 3 Soundings indicate the water depth at the time of inspection and are measured in feet.
- 4 Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

Legend

-4.5 Sounding Depth (8/14/07)
-4.8 Sounding Depth (9/24/02)

Timber Debris

Note:

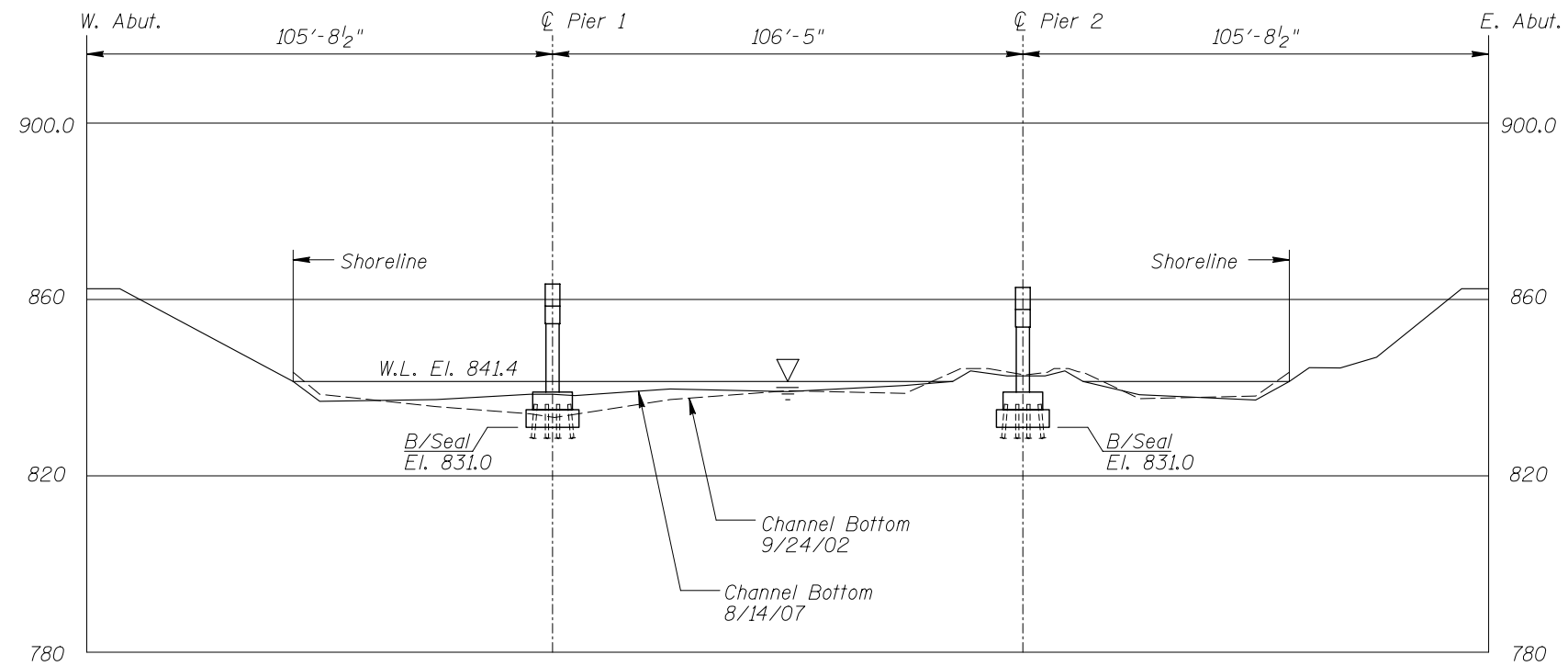
All soundings based on 2007 waterline location.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

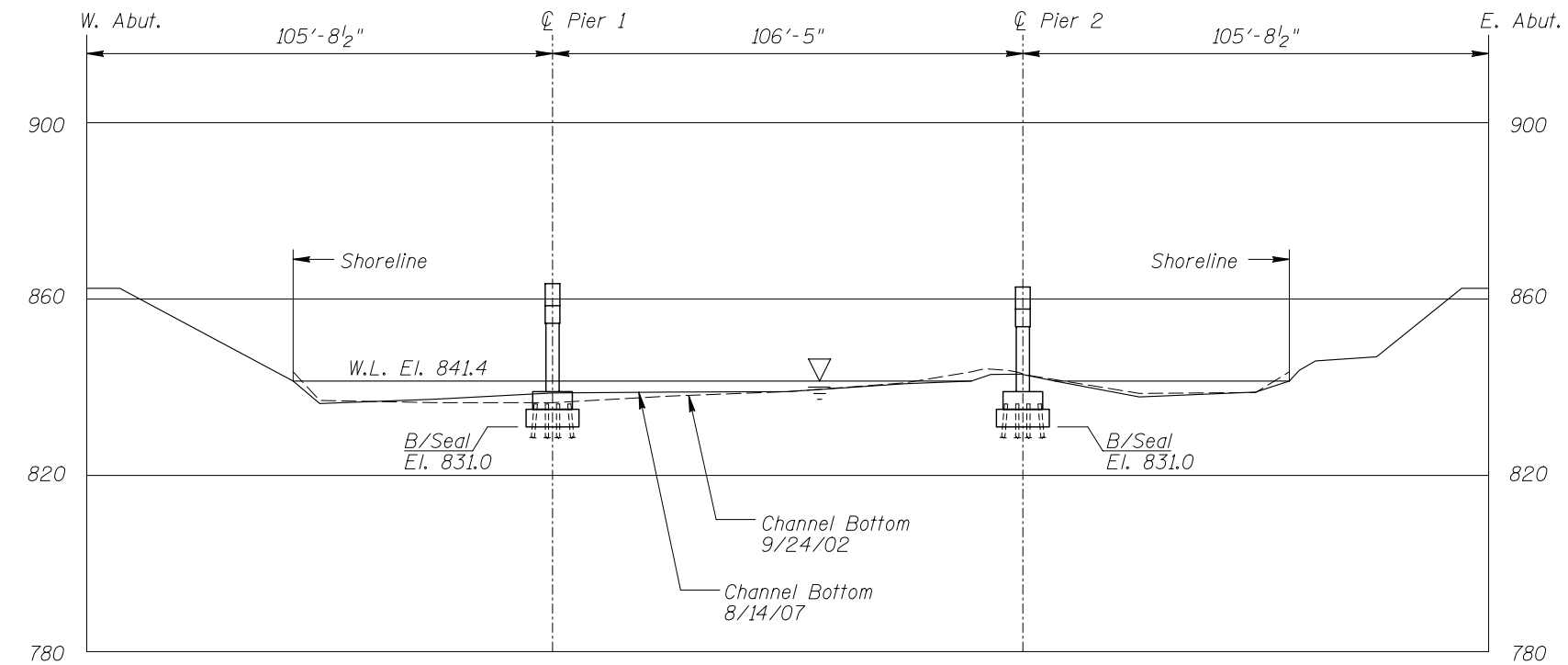
STRUCTURE NO. 27554
OVER THE CROW RIVER
DISTRICT 5, HENNEPIN COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993	Date: SEPT. 2007
Checked By: MDK		Scale: NTS
Code: 52210108		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 27554 OVER THE CROW RIVER DISTRICT 5, HENNEPIN COUNTY UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com ILLINOIS PROFESSIONAL DESIGN FIRM LICENSE NO. 184-000993</small>	Date: SEPT. 2007
Checked By: MDK		Scale: 1"=40'
Code: 522120108		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 14, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 27554 WEATHER: Partly Cloudy, 69°F

WATERWAY CROSSED: Crow River

DIVING OPERATION: ☒ SCUBA ☐ SURFACE SUPPLIED AIR
☐ OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera

TIME IN WATER: 11:55 a.m.

TIME OUT OF WATER: 12:37 p.m.

WATERWAY DATA: VELOCITY None/Negligible

VISIBILITY 0.5 feet

DEPTH 3.1 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the submerged concrete was in smooth and sound condition with no structurally significant defects observed. Pier 1 exhibited vertical footing exposure of up to 8 inches at the southeast corner of the pier. A heavy accumulation of 24-inch-diameter and smaller timber debris was observed upstream of Pier 2 and lodged on a sand bar that surrounded part of the pier. A moderate accumulation of timber debris consisting of logs up to 18 inches was observed surrounding the entire pier shaft of Pier 1. The grouted rip-rap that was to protect the East Abutment exhibited heavy erosion with up to 75 percent loss of material.

FURTHER ACTION NEEDED: ☒ YES ☐ NO

Remove the timber drift that has accumulated around the piers including the large logs on the channel bottom around both piers, which could contribute to scour and footing exposure. Monitor the footing exposure at Pier 1 during future underwater inspections. The grouted rip-rap at the East Abutment should be repaired and/or replaced.

Reinspect the submerged substructure at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 27554
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED Crow River

INSPECTION DATE August 14, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	3.1'	N	8	7	9	N	7	6	8	7	6	7	8	N	N	N	N	N
	Pier 2	N	N	8	N	9	N	8	7	5	5	5	5	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged concrete was in smooth and sound condition with no structurally significant defects observed. Pier 1 exhibited vertical footing exposure of up to 8 inches at the southeast corner of the pier. A heavy accumulation of 24-inch-diameter and smaller timber debris was observed upstream of Pier 2 and lodged on a sand bar that surrounded part of the pier. A moderate accumulation of timber debris consisting of logs up to 18 inches was observed surrounding the entire pier shaft of Pier 1. The grouted rip-rap that was to protect the East Abutment exhibited heavy erosion with up to 75 percent loss of material.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.